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Present and Future Changes in Iowa Agriculture

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PRESENT and FUTURE

Changes in Iowa Agriculture

by H. B. Howell

DRAMATIC CHANGES occurred in the economic structure of Iowa's farm business during the 1960's. Influencing factors included new technology, economies of size, and change in the price relationship between inputs and outputs. Here's a look at the significant changes and the potential future trends.

Farm Numbers

The number of Iowa farming units declined 24 percent (about 4,200 fewer farms per year) from 1960-69. The percent of land operated by the owner changed little, but land value increased $145 per acre (61 percent).

Changes in the economic structure of the farm business are best indicated with figures of gross income, expenses and net income per farm. The size of farm (acres) increased 29 percent while income and expenses more than doubled during the period. Net farm income averaged $8,331 in 1969, an increase of $1,663 over 1968 and $4,461 (115 percent) above the 1960 average (Table 1).

Profitableness of Crops

Studies show that corn and soybeans continue to be the high pro-

TABLE 1. Iowa agricultural statistics, 1960-69.

Factor	1960	1968	1969	Percent Change 1960-69
Number of all farms	180,600	140,800	136,600	−24%
Acres per farm	192	240	247	+29%
Value per acre	$ 237	$ 375	$ 382	+61%
Percent of land owner operated	51%	52%	52%	+2%
Gross income per farm	$ 14,406	$ 25,929	$ 29,568	+105%
Expenses per farm	10,535	19,261	21,237	+102%
Net income per farm	$ 3,871	$ 6,668	$ 8,331	+115%

Source: Iowa Annual Farm Census and U.S.D.A. Farm Income Situation.

TABLE 2. Profitableness of major Iowa crops, 1967-69 average.

	Per Acre				
Crop	Average Yield	Average Price	Income	Operating Cost [1]	Income over Operating Costs [1]
Corn	93.2 bu.	$ 1.07	$100.00	$49.64	$50.36
Soybeans	30.8 bu.	2.49	76.79	30.96	45.83
Oats + Straw	54.5 bu.	0.65	49.42	27.46	21.98
Alfalfa Hay	3.03 T.	19.82	60.07	37.79	22.28

[1]Does not include labor cost or a charge for land
Source: Extension Farm Management, Iowa State University

TABLE 3. Hourly returns for major Iowa crops, 1967-69 average.

	Per Acre				
Crop	Income Over Operating Costs[1]	Land Charge	Labor Earnings	Hours of Labor	Income Per Hour of Labor
Corn	$50.36	$34.72	$15.64	5.5	$2.84
Soybeans	45.83	34.72	11.11	4.4	2.52
Oats + straw	21.98	20.05	1.93	5.3	.36
Alfalfa hay	22.28	20.05	2.23	8.8	.25

[1]From Table 4.
Source: Extension Farm Management, Iowa State University

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fit crops in Iowa. New technological developments in both production and mechanization have played a major part in the maintenance of this position. In addition, the lower cost per unit of fertilizer in recent years has resulted in large increases in its application.

For the 3-year period of 1967-69, labor returns on corn averaged $2.84 per hour and on soybeans, $2.52 per hour. Both figures are lower than earlier years largely because of lower product prices and increased land prices (Tables 2 and 3).

Livestock Income

Livestock income per $100 worth of feed fed over the 1960-69 period provides some clues to potential future trends in livestock production. For all Iowa livestock, income per $100 feed fed averaged $158 for the 10-year period. The range was from a low of $131 in 1963 to a high of $181 in 1969. Since 1965 livestock income per $100 feed fed has averaged better than $150. By 1970 this had resulted in a significant increase in livestock production in Iowa, especially in hogs and beef cattle (Table 4).

The income over feed costs for fed cattle and hens for the 10-year period averaged $131 and $127 respectively, for each $100 feed fed, while hogs averaged $174, beef cows $156 and dairy cows $191. The two enterprises with narrow feed margins (fed cattle and hens) are rapidly moving to much larger units and are shifting away from a direct relationship to individual farm businesses—even in the Corn Belt. Hog and beef-cow production are still closely associated with crop production in using labor and other resources.

Profitableness of Livestock

The following data (See Tables 5 and 6) for Iowa livestock are comparable to the data shown in Tables 2 and 3. In Table 6 two different hourly returns are shown. The one captioned "all costs included" has all feeds including hay and pasture at market price. The other, captioned "for-

TABLE 4. Livestock income per $100 feed fed in Iowa, 1960-69.

	Corn Price	All Livestock	Hogs	Fed Cattle	Beef Cows	Dairy Cows	Hens	Ewes
1960	$ .96	$164	$176	$126	$174	$235	$133	$142
1961	1.08	155	170	125	154	208	121	115
1962	1.09	160	165	148	164	199	111	123
1963	1.04	131	145	92	142	195	130	127
1964	1.11	134	138	117	125	192	119	141
1965	1.13	167	189	154	136	160	120	154
1966	1.19	162	198	123	153	168	158	163
1967	1.13	152	173	128	160	170	98	160
1968	1.04	166	180	151	171	184	120	182
1969	1.08	181	209	152	181	187	160	184
10 Year Av.	$1.09	$158	$174	$131	$156	$191	$127	$149

Source: Extension Farm Management, Iowa State University.

TABLE 5. Profitableness of Iowa livestock, 1967-69 average.

Enterprise Unit	Iowa Av. Price	Livestock and Product Increase	Feed Cost[1]	Other Costs[2]	Income Over Costs[2]
Dairy Cow	$ 4.46 cwt. milk	$555	$288	$157	$110
Beef Cow	28.03 cwt. calves	118	69	31	18
Ewe (10 head)	24.73 cwt. lambs	243	139	56	48
Fed cattle	26.81 cwt. sold	131	92	21	18
Hogs (litter)	20.26 cwt. sold	346	184	57	105
Hens (100 birds)	25.8c doz. eggs	342	271	78	-7

[1]All feeds at market price including forages and pasture
[2]No labor costs included
Source: Extension Farm Management, Iowa State University

TABLE 6. Hourly returns for Iowa livestock, 1967-69 average.

Enterprise Unit	Income Over Costs[1]	Hours of Labor	Income Per Hour: All Costs Included[2]	Income Per Hour: Forages Complementary[3]
Dairy cow	$110	62.5	$ 1.75	$ 2.91
Beef cow	18	7.5	2.42	6.98
Ewe (10 head)	48	26.0	1.83	3.93
Fed cattle	18	6.8	2.67	4.18
Hogs (litter)	105	17.5	6.00	6.13
Hens (100 birds)	-7	39.3	-0.19	-0.19

[1]From Table 7.
[2]All feeds at market price including forages and pasture.
[3]Only harvesting costs included as cost of forages and pasture.
Source: Extension Farm Management, Iowa State University

TABLE 7. Expenses per acre by size of farm, Iowa, 1969.

Farm Size	Total Acres Per Farm: 160	240	320	440	640
Machine, power and fuel	$ 38	$ 31	$ 27	$ 25	$ 21
Taxes, ins., and bldgs.	19	15	14	13	12
Crop expenses	18	15	15	15	16
Hired labor	3	3	3	4	5
Other	7	4	4	3	5
Total	$ 85	$ 68	$ 63	$ 60	$ 57
Non R.E. capital @ 8%	12	10	9	9	8
Operator and family labor	39	27	20	15	10
Total expenses[1]	$136	$105	$ 92	$ 84	$ 75
Machinery investment/A.	$ 53	$ 41	$ 38	$ 35	$ 31

[1]No land charge included. Assumes charge per acre would be same regardless of size of farm.
Source: 1969 Costs and Returns on Iowa Farms, FM 1598, Iowa State University

TABLE 8. Trends in production and capital use in Iowa agriculture (1957-59=100.

	Production Per Man[1]	Capital Per Man	Annual Rate of Capital Earnings
1957-59	100	100	7.3%
60	114	110	7.5
61	123	120	7.5
62	124	123	7.2
63	124	125	4.9
64	146	137	6.8
65	185	155	10.4
66	181	176	9.2
67	192	195	4.2
68	202	207	6.2
69	192	221	9.1

[1]Adjusted for price changes
Source: Annual Iowa Farm Business Summaries, Iowa State University

TABLE 9. Characteristics of high and low profit farms taken from records of 2,500 Iowa farms, 1967-1969 average.

Per Farm	High Profit ⅓ of Farms	Low Profit ⅓ of Farms
Acres	282	273
Total capital	$159,767	$147,533
Net Income	21,451	5,633
Management return	8,147	-6,616
Capital earnings	11.1%	1.4%

Source: 1969 Costs and Returns on Iowa Farms, FM 1598, Iowa State University

ages complementary," includes only a harvesting and storage charge for forages as the forage and pasture cost.

Compared with the hourly returns on crops as shown in Table 3, the hourly returns on livestock explains why some farming businesses have found it profitable to expand the livestock rather than the crop program in recent years. This was a reversal of the trend from 1965 through 1967 when the hourly returns on corn and beans were more than double the returns on livestock.

Expenses by Size of Farm

Cost advantages gained by increasing the size of business are having major influences on decisions in resource use on Iowa farms. Table 7 indicates the influence of size of farm (measured in acres) on costs. The comparisons are based on data from 2,500 farms. The impact of cost advantages is best illustrated by looking at the total expense per acre, including a charge for operator and family labor, and comparing the 240-acre farm with the 640-acre farm. Total expenses are reduced from $105 on the 240-acre farms to $75 per acre on the 640-acre farms, or $30 per acre. This indicates that one 640-acre farm has $19,200 less expenses (640 A. x $30) than if the same land area was organized into 240-acre farm units.

Trends

Production per man (measured in 1957-59 dollars on the 2,500 farms studied) increased 92 percent over the 10-year period or 9.2 percent annually. Capital requirements per man increased 121 percent or 12.1 percent per year, which amounted to an additional $7,500 of capital per year added to the farm business to maintain an efficient and profitable operation.

The rate of capital earnings during the 1957-59 to 1969 period on these farms ranged from 4.2 percent in 1967 to 10.4 percent in 1965, averaging 7.3 percent for the period (Table 8). In addition, persons who owned land during this time had a 6.1 percent annual increase in land value per acre.

Management—The Difference

With new technology and increased capital requirements, the demands for improved management in the farm business has grown. With good management, income has been highly competitive with other opportunities, as indicated by the returns on the high profit one-third of the farms reported in Table 9. The low profit one-third of the farms with almost the same amount of land and capital made only a 1.4 percent return on their capital for a 3-year period, 1967-69. Management return (the amount of income available after a charge has been made for the equity in capital and wages for the operator and family) averaged $8,147 for the high group. The low profit group would have been $6,616 a year better off if they had invested their capital at the going rate of interest and worked for someone else at going farm wages. This difference of $14,763 between the two groups indicates the potential rewards for improved management on Iowa farms.

Future Trends

To pinpoint potential future trends in Iowa farm businesses, it is necessary to make some assumptions. Most are based on past experiences or are projections of current trends. They include the following:

(1) The domestic price level will tend to continue to rise irregularly.
(2) Technology will continue to improve agricultural efficiency at present or even faster rates.
(3) Feed grain and wheat production will continue to exceed current demands.
(4) There will continue to be some type of government program for the protection of farm income.
(5) Hired labor costs will increase more rapidly than other farm inputs.

Based on this background of changes occurring in Iowa's agriculture over the past 10 years, and the assumptions and uncertainties reviewed, the following conclusions seem in order:

The Farm

There are no data to indicate how

big is "too big" as far as acres per farm is concerned in the Corn Belt. The cost advantages of the well-managed large units continue to increase.

Much of the gain from new technology and government programs will continue to be capitalized into land value. When buying land in the future there will be greater consideration for the facilities on that land.

Land is a non-depreciable, non-self-liquidating asset and its ownership will continue to play a major role in capital generation in a farm business. Most farming units will be a combination of owned and leased land. There will be an increase in the number of two-man livestock farms. The sole proprietor farm business structure based on a family farming unit will continue to dominate as long as land is considered a reasonable long-term investment and an inflation hedge.

Credit and Financing

The use of contracts as a basis for land ownership transfer will increase. Systems of financing will be developed that may make the equity in land contracts have much the same position as equities in a deed and mortgage transfer.

Income sharing or participation agreements will increase in use as a method of bringing new entrants into agriculture.

Decisions relating to farm business organization, capital investment and disinvestment will be more strongly influenced by income and estate tax regulations.

The increased demand for intermediate-term capital will force farm borrowers and lenders to seek new sources of risk capital.

Leasing of intermediate use assets such as machinery, facilities, and breeding stock may increase if current credit sources cannot meet the demand for intermediate-term credit.

Mechanization and Labor

Agriculture is still far from being completely mechanized. Mechanization will continue at a more rapid rate in agriculture than the rest of the economy. This is because farm labor costs will rise more rapidly than non-labor costs. Automation in livestock production will continue to increase the volume but do little to lower the operating cost. It will provide the opportunity to use additional capital and spread management over a larger volume.

Increasing farm size to take advantage of the new high-capacity machines will continue to dominate in planning the farm business.

The role of part-time skilled help in operating machines nearly around the clock at certain times of the year will increase.

Collective bargaining to achieve better hours and more fringe benefits will become a factor in the farm labor market in the Corn Belt.

Marketing

Corn Belt producers will increase their efforts to become price makers for their products. The use of product contracting, forward pricing, hedging and related systems will increase.

Producers who have a minimum of crop production risk or those with adequate capital will continue to carry most of their production and marketing risks themselves. Their concern will center around marketing systems that improve the opportunity to get better returns for quality products or establishing a price for inputs and purchases.

There will be much confusion over whether marketing proposals are pricemaking or risk-reducing for the individual.

Livestock Production

Cattle feeding, egg, and broiler production will continue to be concentrated into larger units and will become less and less associated with the farm business as we know it today.

In hog farrowing and beef raising, the cost of feeder animals will continue to be high relative to fed animals. The capital and management requirements and the limitation of mechanization will demand relatively high prices for feeder animals.

The competitive position of the dairy enterprise will continue on the weak side.

The hog enterprise will continue as a strong companion to corn production on many farms.

Areas that produce large amounts of forages will increase beef cow and calf production.

Corn and-or stover silage will increase as the major source of harvested roughage for all roughage consuming enterprises and will release much grass forage for pasture use and encourage beef-cow production.

A major limitation on the concentration of livestock production into larger units in the humid areas of the country may be the inability to meet the environmental standards established for the disposing of manure and odor control.

Land Use and Crop Production

Corn and soybeans will continue to be the high profit crops in the Corn Belt. Even with the current production problems encountered with corn, no other crop has the comparative advantage of these two crops. Soybean acreage will expand more rapidly than corn acreage. Corn and soybean production will become even more concentrated in level land areas.

Investments in land improvement to increase or maintain row crop acreage will be profitable including terracing, land leveling and drainage. Where water can be obtained economically, irrigation will continue to increase.

Summary

Farm operators can expect continuation of a reasonably good income climate if they can obtain control of adequate resources and make the necessary adjustments as new technology is developed.

The returns to good management will be high enough to attract competent managers into agriculture.

Gaining control of an adequate size land base to assure an efficient operation will be the major limiting factor for new entries into farming.

The small farm business will be increasingly under severe cost and income pressure.